Pulmonary Metastases from Cervical Adenocarcinoma Regress to a 'Hole' Lot of Nothing

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Abstract: A 38-year-old woman with recurrent metastatic cervical adenocarcinoma developed innumerable bilateral solid and cavitating pulmonary metastatic nodules. After chemotherapy with paclitaxel and carboplatin, all these nodules regressed to air filled cystic structures with imperceptible walls, pneumatoceles. Immunocompromised patients require close monitoring for development of these as they may be complicated by secondary infection, pneumothorax formation or develop into a tension pneumatocele.

Key Words: Cervical adenocarcinoma, Chemotherapy, Pneumatocele, Pulmonary metastases.

(*J Thorac Oncol.* 2009;4: 552–554)

Untreated pulmonary metastases, including those from cervical adenocarcinoma, commonly present as solid or cavitating nodules on computed tomography (CT) examinations of the chest.[1–5] Partial regression following treatment is described as lesion stability or reduction in number and/or size of lesions. Complete regression requires entire disappearance of the nodules or residual scar formation.[1,2,4]

This case highlights an unusual pattern of regression in which innumerable bilateral solid and cavitating pulmonary metastases from metastatic cervical adenocarcinoma all transformed into pneumatoceles with imperceptible walls following paclitaxel and carboplatin chemotherapy.

CASE REPORT

A 38-year-old woman presented with cervical adenocarcinoma diagnosed from a routine Papanicolau test. Examination under anesthesia revealed a 4 cm exophytic mobile cervical mass staged FIGO 1B2. Magnetic resonance imaging of the pelvis showed no tumor extension to the parametria, urinary bladder or rectum, however, iliac lymph nodes were regarded suspicious with subsequent Positron Emission Tomography scan demonstrating uptake in the tumor, lower uterine segment, left iliac and para-aortic lymph nodes (Figure 1).

Initial treatment consisted of chemo-radiotherapy including weekly cisplatin, external beam radiation (45 Gy in 25 fractions over 5 weeks plus reduced volume boost of 50.4 Gy in 28 fractions over 5.5 weeks) to pelvic and para-aortic lymph nodes and pelvic brachytherapy (5.4 Gy in 3 fractions over 5 weeks). The cisplatin was ceased after 3 weeks due to gastrointestinal toxicity and pancytopenia.

Restaging CT and Positron Emission Tomography performed 4.5 months after the completion of the initial chemo-radiotherapy revealed local pelvic recurrence and widespread metastatic disease. A subsequent CT 3 months later demonstrated innumerable bilateral solid and cavitating pulmonary nodules, all measuring less than 1 cm diameter (Figures 2*A*, *B*) and mediastinal and hilar lymphadenopathy (Figure 2*C*). Palliative chemotherapy with weekly paclitaxel (80 mg/m^2) and carboplatin (area under curve = 2) was commenced with three cycles being completed before the patient developed neutropenia and thrombocytopenia. Chemotherapy was ceased for 4 weeks before weekly paclitaxel (80 mg/m^2) was reinstituted for 11 cycles. Ongoing bone marrow toxicity required a reduced dose (60 mg/m^2) for the last two cycles. The palliative chemotherapy was ceased after 14 cycles as the potential risks of ongoing bone marrow toxicity were deemed to outweigh the potential benefits of further treatment.

Repeat CT performed at the time of paclitaxel recommencement demonstrated complete transformation of all the pulmonary nodules to pneumatoceles with imperceptible walls (Figures 3*A*, *B*), in addition to global reduction in the chest and abdomino-pelvic lymphadenopathy. A CT 3 months later, 15 months after commencement of the initial chemo-radiotherapy, confirmed stability of the pneumatoceles and lymph nodes.

DISCUSSION

Pulmonary metastases commonly present as solid or cavitating nodules, the latter being described in cases of adenocarcinoma, squamous cell carcinoma, synovial sarcoma, and transitional cell carcinoma.[1,2,4–9]

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Disclosure: The authors declare no conflicts of interest.

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The manuscript is solely the work of the above listed authors.

Ethical guidelines were adhered to during the preparation of this submission.

ISSN: 1556-0864/09/0404-0552

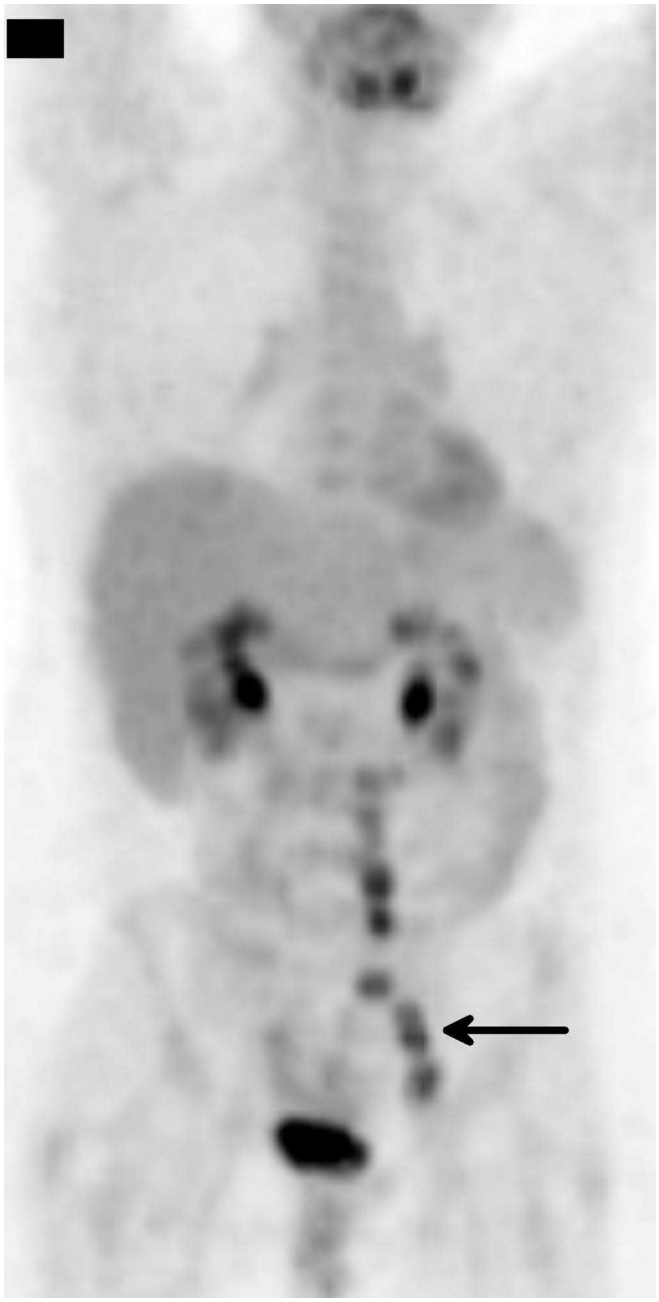

FIGURE 1. Positron Emission Tomography (PET) image demonstrating intense F-18 Fluorodeoxyglucose (FDG) uptake by uterine cervix, lower uterine segment, left iliac lymph nodes (arrow), and L2 retroperitoneal lymph nodes.

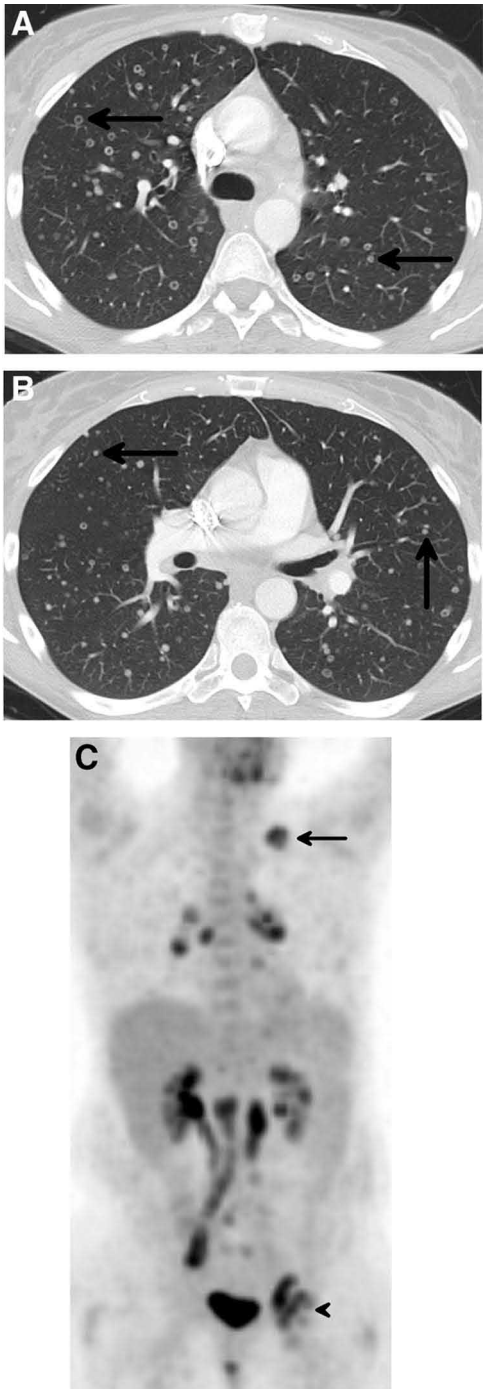

FIGURE 2. Axial computed tomography (CT) chest (lung window) demonstrating multiple bilateral solid and cavitating pulmonary metastases (arrows) at (*A*) carinal and (*B*) subcarinal levels. *C*, Restaging Positron Emission Tomography (PET) image confirming metastatic activity with intense F-18 Fluorodeoxyglucose (FDG) uptake in bilateral iliac, left inguinal (arrowhead), left pelvic wall, para-aortic and retro-crural regions as well as within the lungs and Virchow node (arrow).

Complete regression of solid pulmonary metastases arising from cervical adenocarcinoma, squamous cell carcinoma and endometrial adenocarcinoma after treatment with systemic paclitaxel and carboplatin has been described.[1,2,4,5] In these cases, the metastatic pulmonary nodules were either replaced by scar tissue or disappeared completely leaving normal lung on subsequent CT examinations.

Our report presents an unusual outcome in a patient with recurrent metastatic cervical adenocarcinoma in which

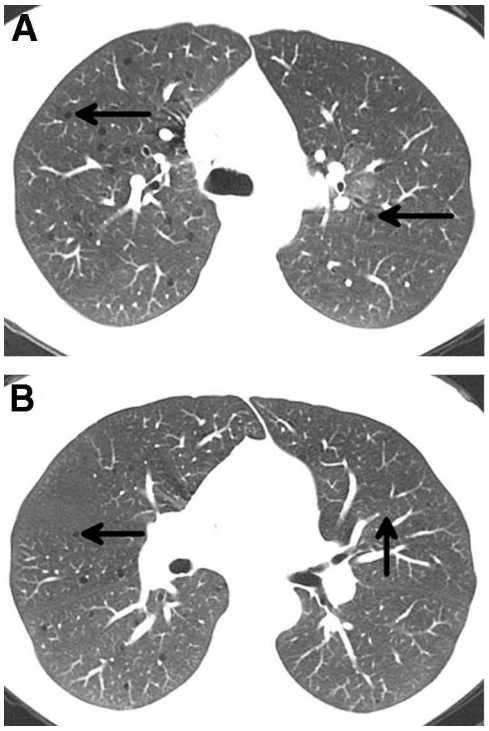

FIGURE 3. Axial computed tomography (CT) chest (lung window) showing regression of solid and cavitating pulmonary metastases to pneumatoceles (arrows) at (*A*) carinal and (*B*) subcarinal levels.

innumerable solid and cavitating pulmonary metastases regressed to stable pneumatoceles following palliative paclitaxel chemotherapy. To our knowledge, this outcome has not been described in the literature.

Pneumatoceles are thin-walled air filled cysts which arise within lung parenchyma and are classically associated with infection, hydrocarbon ingestion, trauma or positive pressure ventilation. Regardless of their etiology, pneumatoceles may be complicated by secondary infection, pneumothorax and may develop into a tension pneumatocele.[10] Patients in which pulmonary metastases regress to pneumatoceles with chemotherapy treatment should be closely monitored for development of these complications, especially secondary infection, given the patients' potential immunocompromise.

ACKNOWLEDGMENTS

No support or funding was accepted from external sources in the preparation of this submission.

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